



Validation of the Short Posttraumatic Stress Disorder Rating Interview (expanded version, Sprint-E) as a measure of postdisaster distress and treatment need

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Abstract

Objective: Professionals and paraprofessionals working in disaster settings need tools to identify persons with mental health needs. To validate the Sprint-E as a measure of postdisaster distress and treatment need, the authors tested (1) the concurrent validity of the measure compared with other measures of distress, (2) the sensitivity and specificity of a "3/7 rule" on the Sprint-E relative to probable PTSD diagnosis, and (3) the hypothesis that Sprint-E scores would be stable in the absence of treatment but would improve in its presence.

Method: In Study 1, data were collected at the point of enrollment from 165 adults participating in a Florida treatment program implemented in response to the 2004 hurricanes. In Study 2, data were collected at points of referral, pretreatment, and intermediate treatment from 128 adults participating in a Baton Rouge Louisiana treatment program implemented in response to the 2005 hurricanes, Katrina and Rita.

Results: The utility of a 3/7 rule for the Sprint-E, with 3 suggesting possible and 7 suggesting probable treatment needs, was supported in Study 1. Tested against the PTSD Checklist, the Sprint-E performed well in ROC analyses (area under the curve = 0.87); a score of 7 achieved sensitivity of 78 percent and specificity of 79 percent. In Study 2, Sprint-E scores evidenced little change between referral and pretreatment but substantial change between pretreatment and intermediate treatment.

Conclusion: The Sprint-E is useful as an assessment and referral tool in situations where more

in-depth assessment is not feasible and mental health services are available.

Key words: disaster, PTSD, treatment, assessment, referral

Introduction

Research suggests that disasters have significant and pervasive effects on mental health. Symptoms of depression, anxiety, and, especially, posttraumatic stress disorder (PTSD) are highly prevalent in the immediate aftermath of disasters. While the general trend is for postdisaster symptoms to dissipate over time, this is not always the case, leaving a substantial minority of survivors chronically distressed (see Norris et al.¹ for a review of these points).

In response to this evidence, investigators and expert panels²⁻⁵ have advocated for greater scientific attention to develop and evaluate interventions that can be implemented feasibly, safely, and effectively after disasters. Commonly, such discussions quickly turn to the question of "screening," the identification of persons who would benefit most from the proposed interventions. This is not a simple matter. There are many conceptual difficulties, including the nonspecific, normative, and transient nature of many postdisaster symptoms, which may or may not conform to precise criteria for disorder or treatment need. Critics⁶ point out that the ultimate value of screening depends not only on the availability of reliable, valid, and efficient instruments for guiding decisions, but also on careful consideration of ethical dilemmas (eg, What is

the consequence of a false positive?), the availability of services (screening must be a means to an end not an end in itself), and the likelihood that people would find their own way into the service sector without need for formal assessment or referral.

This last point, in particular, might lead one to question the need for investing resources in developing disaster assessment and referral strategies. In the United States, services and service providers are indeed abundant after disasters. A variety of programs funded by the Federal Emergency Management Agency (FEMA), non-governmental organizations, and faith-based institutions help disaster victims find loans, housing, jobs, various social services, and occasionally medical care. After presidentially declared disasters, FEMA also funds brief crisis counseling services designed to educate community members about normal reactions to disaster and to increase their capacity to manage stress.⁷ Quite possibly, this is the right amount of intervention for normally resilient people who need only sound practical, informational, and emotional support to get by.

However, crisis counseling is probably inadequate for survivors who have developed more severe or persistent psychological problems, such as PTSD or major depressive disorder.⁸ Evidence is limited, but it appears that proportionately few recipients of disaster relief or crisis counseling services are referred to more intensive mental health interventions.⁹ Practitioners, such as physicians and social workers, are generally poor at recognizing mental health needs,¹⁰ and in the aftermath of disaster, psychological needs may be overshadowed by the urgency of tangible needs.

While not a complete solution, the availability of brief, easily administered assessment instruments could facilitate referrals to mental health treatments. Ideally, such an instrument would attempt to address at least some of the dilemmas present in screening for mental health needs after disasters. One potentially useful measure is the "Sprint-E," an expanded 12-item version of the 8-item Short Posttraumatic Stress Disorder Rating Interview (SPRINT).¹¹ Several attributes make the Sprint-E promising as a measure of postdisaster distress and treatment need. One attribute is the fact that it includes the items of the original SPRINT. The first four questions (see Appendix)

explicitly assess core symptoms of PTSD (intrusion, avoidance, numbing, and arousal) as they relate to a target event. PTSD is the most prevalent mental health problem after disasters,^{1,12} and no referral instrument would be complete without measuring it. In both clinical and community samples, the SPRINT has shown strong concurrent validity with other measures of PTSD, such as the Davidson Trauma Scale.¹¹ The SPRINT also appears to be sensitive to PTSD treatment, as shown by significant mean improvements in two small psychopharmacology trials.^{13,14}

However, the Sprint-E is not solely a measure of PTSD. Despite its primacy, PTSD does not capture the full range of postdisaster psychological problems.^{1,2,4,15} The Sprint-E augments the assessment of PTSD in three complementary ways. First, it assesses other important stress reactions such as depression (item S5) and health behavior concerns (item S7). The original SPRINT somatization item (How much have you been bothered by pain, aches, or tiredness?) was substantially altered in the Sprint-E to capture respondents' perceptions of whether they are drinking more, smoking more or eating poorly. Suicidality (item S12) is not included in the score but was included in the Sprint-E as a precaution; the instructions call for immediate referral to psychiatric services when this question is answered affirmatively.

Second, the SPRINT and Sprint-E give considerable attention to functional impairment, reflected in questions about stress tolerance (S6), role functioning (S9), and social functioning (S10). Dysfunction is often thought of as the bridge between symptoms and treatment need,¹⁶⁻¹⁸ and this may be especially relevant in the case of disasters where some distress is normative.^{6,15}

Third, the Sprint-E has two items that assess perceived need for help: item S8, bothered by reactions; and item S11, need for help. Objective need (diagnosis) and subjective need for mental health treatment are far from synonymous; service use is not limited to persons with disorders, and many persons with disorders do not perceive a need for help.^{16,19,20}

An additional promising attribute of the Sprint-E is that it is scored as the number of "intense" reactions when used as an assessment and referral tool in the

field. An intense reaction is defined as a score of 4 (*quite a bit*) or 5 (*very much*) on a 5-point scale. (The measure can be scored as a continuous scale, with full range of 11 to 55, in other contexts.) This focus yields both conceptual and practical advantages. As for the former, the focus on intense reactions, as opposed to reactions of moderate strength, addresses the concern that moderate levels of distress are expected after disasters and may resolve on their own or with less intensive interventions, such as crisis counseling. As for the latter, the focus on intense reactions makes the measure simple to score (see Appendix).

Many of the attributes of the Sprint-E (brevity, simplicity of administration, focus on intense reactions, emphasis on function, and subjective need) emerged because it was developed collaboratively between researchers and leaders of *Project Liberty*, New York's crisis counseling program related to the September 11th terrorist attacks.²¹ Project Liberty leaders were seeking a mechanism for referring crisis counseling participants to "enhanced services" (treatment). The development of the Sprint-E was thus consistent with the advice of Southam-Gerow, Ringeisen, and Sherrill²² to develop "practice friendly" instruments that assess outcomes of relevance to consumers, providers, and policy-makers. In a study of 800 adults in crisis counseling two years after 9/11, the Sprint-E was found to be unidimensional and equally internally consistent ($\alpha = 0.93$) across ethnic groups in the sample (458 non-Hispanic White participants, 118 African American participants, 181 Hispanic participants).²¹ A criterion of three intense reactions was set as the initial guideline for referral to enhanced services. Referral acceptance increased linearly with the number of intense reactions until it peaked and stabilized at seven intense reactions (85 percent acceptance). This result led to a working "3/7 rule" for the Sprint-E, with 3 suggesting possible and 7 suggesting probable treatment need (see, for example, the New Orleans needs assessment of CDC²³).

The SPRINT was a valid starting point for the goal of developing a postdisaster assessment and referral tool, but both its content and scoring procedures were modified to create the Sprint-E. Thus, the purpose of the present study was to validate the

Sprint-E as a measure of postdisaster distress and need for treatment. The data were collected as part of two service programs. Both programs began more than one year after the focal events and were concerned with chronic postdisaster problems rather than acute stress. Neither required diagnosis to participate. The first program, *Project Recovery*, was funded by the Substance Abuse and Mental Health Services Administration (SAMHSA) and implemented by the state of Florida in response to the 2004 hurricanes. Participants were eligible for a range of services, including cognitive behavioral therapy (CBT), substance use treatment, and case management. Here, we use the data collected at the point of enrollment from 165 adults to examine the concurrent validity of the Sprint-E compared with other measures of distress, and the sensitivity/specificity of the 3/7 rule relative to probable PTSD diagnosis. PTSD provided the most appropriate external criterion because like "postdisaster distress," but unlike mood and other anxiety disorders, it is anchored to a particular experience. Although our purpose was not to create another measure of PTSD, this analysis was important because PTSD is the most common disorder after disasters; if the Sprint-E failed to detect PTSD, the instrument would have limited utility.

The second program, *InCourage*, was funded and implemented by the Baton Rouge Area Foundation (Louisiana) in response to the 2005 hurricanes Katrina and Rita. All InCourage participants received CBT for Postdisaster Distress³ and completed the Sprint-E at referral, pretreatment (enrollment), intermediate treatment, posttreatment, and follow-up. InCourage is still in progress. We used the referral, pretreatment, and intermediate treatment data from 128 adults to examine stability and change in Sprint-E scores. We hypothesized that, if the Sprint-E was indicative of treatment need, Sprint-E scores should be stable in the absence of treatment but should improve in its presence.

Study 1: Florida, Project Recovery method

Participants

Between September 2005 and December 2006, 165 adults who had been exposed to any of the 2004

Florida hurricanes enrolled in Project Recovery and completed a set of pretreatment measures. Project Recovery participants were referred for services by local community agencies, outreach programs conducted by project staff, and by crisis counselors working for another Florida program, *Project H.O.P.E.* Project H.O.P.E. provided support, education, and linkages to behavioral health services to hurricane survivors who needed additional help recovering from the negative effects of the disaster.

Most Project Recovery participants were women (78 percent). One third (34 percent) were age 18-39, 52 percent were age 40-59, and 15 percent were age 60 or older. Non-Hispanic White participants were best represented (58 percent), but there was good representation of non-Hispanic Black participants (21 percent) and Latinos (any race, 21 percent). Approximately, 17 percent of participants had less than a high school education, 64 percent had completed high school or had some college, and 19 percent were college graduates. Participants had experienced a broad range of disaster-related stressors. Exposure to trauma was common, including injury (18 percent), life threat (35 percent), family member missing or dead (9 percent), friend missing or dead (13 percent), witnessing injury (20 percent), or participating in rescue or recovery efforts (19 percent). Other common stressors included damage to home (78 percent), disaster-related unemployment (43 percent), and other financial loss (74 percent).

Measures and procedure

The three measures of distress were self-administered (paper and pencil) unless help was requested, which was rare. The first measure was the Sprint-E,²¹ which we scored in three ways. As a sum of scores on 11 items (S12 was not included), the Sprint-E total score ranges from 11 to 55 ($\alpha = 0.92$). As a screening tool, the Sprint-E is scored more simply as the number of intense reactions, where an "intense reaction" is an item with a score of 4 or 5. For scoring a measure comparable to the original SPRINT, we recoded items from a 1-5 to a 0-4 scale and summed items 1-4, 6-7, and 9-10 (range 0-32, $\alpha = 0.89$).

The second measure was the PTSD Checklist (PCL).²⁴ The PCL, among the most frequently used

measures of PTSD, consists of 17 questions that correspond to symptom criteria for PTSD in the *Diagnostic and Statistical Manual* (DSM; Version IV).²⁵ Participants were asked how often they have been bothered by each symptom in the past month on a 5-point (1-5) severity scale. The PCL total score was calculated as the sum of all items (range = 17-85; $\alpha = 0.93$). Subscales were created by summing items corresponding to particular symptom criteria for intrusion (B, 5 items), avoidance (C1, 2 items), numbing (C2, 5 items), and arousal (D, 5 items). The PCL was also scored as a dichotomous measure approximating a PTSD diagnosis. An individual was classified as meeting symptom criteria (BCD) for PTSD if he or she scored 3 or higher on at least 1 of the 5 intrusion items, 3 of the 7 avoidance/numbing items, and 2 of the 5 arousal items. An individual was classified as meeting severity criteria for the diagnosis of PTSD if the PCL total score was 44 or above.²⁶ We also examined these two methods of generating criterion PTSD diagnoses from the PCL in combination.

The third measure was the 11-item Iowa Depression Scale, a short form of the Center for Epidemiologic Studies Depression Scale.²⁷ Each item indicates the frequency of the depressive symptom over the past week, where 0 = *hardly ever or never*, 1 = *some of the time*, and 2 = *much or most of the time*. The potential range is 0 to 22 ($\alpha = 0.85$).

Results

Descriptive statistics and correlations

Table 1 shows the mean, standard deviation, and the percentage of cases scoring at or above 4 for each Sprint-E item. The frequency of intense reactions was no less than 50 percent on any item, showing that this help-seeking sample had considerable distress. The total number of intense reactions ranged from 0 to 11 and averaged 6.9 (SD = 3.4; 58 percent ≥ 7).

Table 1 also shows the correlations between the Sprint-E items and the PCL total and subscales and the Iowa Depression Scale. The pattern provides good evidence of concurrent validity of the Sprint-E. The total Sprint-E correlated 0.85, $p < 0.001$, with the total PCL. The Sprint-E intrusion item correlated more

Table 1. Descriptive statistics and correlations for Sprint-E total score and items (Florida sample, N = 165)									
Sprint-E items	M	SD	percent 4+	PCL total	PCL intrusion	PCL avoidance	PCL numbing	PCL arousal	Iowa depression
Total Sprint-E	40.30	10.70	–	0.85	0.72	0.57	0.70	0.74	0.62
Intrusion	3.51	1.36	56	0.70	0.73	0.48	0.48	0.56	0.41
Avoidance	3.33	1.40	52	0.48	0.43	0.50	0.32	0.39	0.25
Numbing	3.65	1.34	64	0.69	0.56	0.45	0.60	0.60	0.58
Arousal	3.96	1.27	75	0.72	0.59	0.38	0.56	0.72	0.54
Depression	4.01	1.12	77	0.55	0.41	0.37	0.49	0.50	0.56
Impaired stress tolerance	3.62	1.29	60	0.59	0.51	0.42	0.50	0.50	0.47
Impaired health behavior	3.50	1.37	60	0.63	0.54	0.35	0.54	0.58	0.44
Bothered by reactions	3.88	1.21	68	0.60	0.52	0.43	0.51	0.50	0.39
Impaired role functioning	3.43	1.42	56	0.66	0.51	0.43	0.61	0.58	0.50
Impaired social functioning	3.45	1.36	51	0.61	0.51	0.34	0.56	0.53	0.46
Need for assistance	3.94	1.25	72	0.68	0.56	0.46	0.58	0.58	0.47
Note: PCL = PTSD Checklist. All Sprint-E items were scored on a 5-point scale, 1 = not at all, 2 = a little bit, 3 = moderately, 4 = quite a bit, 5 = very much. A score of 4 or 5 was considered as intense reaction. All correlations significant at $p < 0.01$.									

highly with PCL-intrusion, $r = 0.73$, $p < 0.001$, than with the other scales and subscales. The Sprint-E avoidance item correlated most highly with PCL-avoidance, $r = 0.50$, $p < 0.001$, and the Sprint-E arousal item correlated most highly with PCL-arousal, $r = 0.72$, $p < 0.001$. The Sprint-E numbing item showed less specificity, correlating more highly with the total PCL, $r = 0.69$, $p < 0.001$, than with PCL-numbing, $r = 0.60$, $p < 0.001$. The depression item correlated strongly with the Iowa Depression Scale, $r = 0.56$, $p < 0.001$, but correlated equally highly with the total PCL, $r = 0.55$, $p < 0.001$.

One of the strengths of the Sprint-E is its attention to functioning, distress over one's reactions, and

perceived need for help, apart from the specific psychological condition that may have produced the impairment. These 6 items correlated strongly with the total PCL, $r_s = 0.59$ - 0.68 , all $p_s < 0.001$, and the Iowa Depression Scale, $r_s = 0.39$ - 0.50 , all $p_s < 0.001$.

ROC analyses: sensitivity and specificity

Table 2 provides the summary results from receiver operating characteristic (ROC) analyses using the PCL as the criterion measure. Because the PCL has been scored in different ways, we show results for three variations of the criterion variable, PTSD: (1) met symptom criteria BCD on the PCL ($n = 108$, 66 percent), (2) at or above a severity score of 44 on the PCL ($n = 116$,

Table 2. ROC analyses: SPRINT variants by PTSD on the PCL (Florida sample, N = 165)						
	Met Criteria BCD on PCL		Above PCL cut-point		Both true	
	Area	CI	Area	CI	Area	CI
Original SPRINT	0.907	0.852-0.962	0.922	0.874-0.970	0.902	0.848-0.956
Sprint-E total	0.903	0.848-0.958	0.924	0.881-0.968	0.900	0.847-0.953
# intense reactions	0.877	0.819-0.936	0.894	0.841-0.947	0.870	0.812-0.928
Note: PCL = PTSD Checklist. Area = area under the curve. CI = confidence interval. All areas were significantly > 0.5 at $p < 0.001$.						

Table 3. Percents correctly classified (specificity, sensitivity, and efficiency) by Sprint-E scores at or above different numbers of intense reactions (Florida sample, N = 165)									
# Intense reactions	Met Criteria BCD on PCL			Above PCL cut-point			Both true		
	Noncases	Cases	All	Noncases	Cases	All	Noncases	Cases	All
3	40.4	99.1	78.7	44.9	98.3	82.4	38.3	99.0	76.9
4	52.6	97.2	81.8	59.2	96.6	85.5	50.0	97.1	80.0
5	63.2	94.4	83.6	69.4	93.1	86.1	60.0	94.3	81.8
6	70.2	88.0	81.8	75.5	86.2	83.0	66.7	87.6	80.0
7	80.7	78.7	79.4	83.7	75.9	78.1	78.3	79.0	78.8
8	86.0	70.4	75.8	85.7	66.4	72.2	83.3	70.5	75.1
9	89.5	59.3	69.7	93.9	57.8	68.5	90.0	61.0	71.5
Note: Cases and noncases are based on the PTSD Checklist.									

70 percent), and (3) both true, the most conservative definition ($n = 105$, 64 percent). We show the results for three variations of the test variable: (1) original SPRINT, which was intended as a measure of PTSD, (2) Sprint-E total score, and (3) number of intense reactions, a simple way of scoring the Sprint-E in the field. The areas under the curves in all of these analyses were very high, ranging from 0.87 to 0.92, all $ps < 0.001$. The performance of the Sprint-E was virtually identical to that of the original SPRINT. The number of intense reactions performed slightly less well, but not strikingly so, given the simplified scoring and reduced range of the measure.

Table 3 provides more specific information about the sensitivity and specificity for PTSD of the Sprint-E,

scored as the number of intense reactions. On the basis of preliminary research in New York,²¹ we created a working "3/7" rule for the Sprint-E, corresponding to "possible/probable" treatment need. Our hypothesis was that few cases would be missed at a score of 3 intense reactions (highly sensitive but many false positives) and that people scoring 7 or higher would almost certainly be cases. This working rule was generally confirmed in these data. A score of 3 intense reactions on the Sprint-E missed only 1-2 percent of PTSD cases. A score of 7 was the cut-point that worked equally well for cases and noncases, typically 78-80 percent. This value adheres to the recommendations of Matthey and Petrovski,²⁸ who noted that

generally, sensitivity values of 70 percent or greater are essential for screening instruments, and sensitivity values of 80 percent or greater are worthwhile.

Relative to persons meeting symptom criteria on the PCL, the positive predictive value (PPV) of a Sprint-E score of 7 was 0.86 (85/96). Conversely, there were 11 persons who scored a 7 or above on the Sprint-E who did not meet symptom criteria on the PCL. Nine of them were missing a single symptom on a single criterion (5 on C, 2 on B, 2 on D). One of the remaining two was quite symptomatic on the PCL (although not in the diagnostic pattern) and scored highly on the Iowa Depression Scale, and the other was moderately symptomatic on both PTSD and depression. Relative to persons scoring above the severity cut-point (44) on the PCL, the PPV of a Sprint-E score of 7 was 0.92 (88/96). The negative predictive values (NPVs) for a Sprint-E score of 7 were 0.67 (46/69) and 0.60 (41/69), respectively, for these two ways of scoring the PCL. For a Sprint-E score of 3, PPVs were 0.76 and 0.81, and NPVs were 0.96 and 0.92. Simply put, one can be almost certain that PTSD is absent if a Sprint-E score is <3 and almost certain that PTSD is present if the Sprint-E score is ≥ 7 . In-between these scores, PTSD is possible, and further assessment may be warranted.

Overall, a score of 5 was the most accurate cut-point for this sample, correctly classifying from 82 percent to 86 percent of participants. This result, however, is partly a function of the high percentage of PTSD cases in the sample (64-70 percent) and might not replicate.

Study 2: Baton Rouge, InCourage method

Participants

Between January 2007 and December 2007, 128 adults who had been exposed to either Hurricane Katrina or Hurricane Rita enrolled in InCourage and provided the three repeated assessments necessary for inferences regarding the Sprint-E's stability in the absence of treatment (referral vs pretreatment) and improvement in its presence (pretreatment vs intermediate treatment). The hypothesized pattern would support the Sprint-E's validity as a measure of treatment

need. To date, 89 of these 128 adults have completed the program, which is still active.

Clients were recruited for the InCourage program through advertisements, clinician referrals, and direct calls to the Baton Rouge Crisis Intervention Center (BRCIC). All participants lived in the greater Baton Rouge area, and most (89 percent) had been displaced by Hurricane Katrina. Most of these adults were women (80 percent). One fourth (24 percent) were age 18-39, 67 percent were age 40-59, and 9 percent were age 60 or older. Over half (57 percent) of the participants were African American, 37 percent were non-Hispanic White, and 6 percent were other or mixed race/ethnicity (5 Latino, 2 American Indian, 1 mixed race). Approximately 13 percent of participants had less than a high school education, 61 percent had completed high school or had some college, and 26 percent were college graduates. Traumatic stressors included injury (10 percent), life threat (30 percent), family member missing or dead (35 percent), friend missing or dead (50 percent), witnessing injury (36 percent), and participating in rescue or recovery efforts (25 percent). Other stressors included damage to home (87 percent), disaster-related unemployment (60 percent), and other financial loss (86 percent).

Measures and procedure

The Sprint-E ($\alpha = 0.83-0.91$) is being administered in InCourage five times: at the point of referral, at the beginning of Session 1 (point of enrollment or pretreatment), at the beginning of Session 3 (intermediate), at the beginning of Session 10 or the last session, if before Session 10 (posttreatment), and at 6-month follow-up. At the point of referral, the Sprint-E was administered by a telephone counselor at BRCIC. Callers to BRCIC were sometimes self-referred and sometimes referred by other community programs. Counselors used a Sprint-E score of 3 or more intense reactions as the typical criterion for referral to InCourage but were given discretion to refer anyone to the program. At pretreatment, intermediate treatment, and posttreatment sessions, the Sprint-E was administered by a trained therapist. To keep the evaluation brief for this community-based project, no other distress measures were included in

the evaluation protocol. The median number of days between referral and enrollment was 7; the median number of days between enrollment and intermediate assessment was 16.

Results

At the point of referral, almost all of the participants (95 percent) acknowledged at least 3 intense reactions on the Sprint-E, and most acknowledged 7 or more intense reactions (80 percent; see Table 4). By Session 1 (enrollment, pretreatment), the percentage

acknowledging 3 or more intense reactions (90 percent) had changed little, but the percentage acknowledging 7 or more (59 percent) had decreased notably. However, the changes were much greater between pretreatment and intermediate treatment. By Session 3, the percentage of participants with 3 or more intense reactions had decreased to 53 percent and the percentage with 7 or more had decreased to 27 percent. Of the 11 specific intense reactions, three showed significant declines in frequency between referral and pretreatment: arousal, bothered by reactions, and impaired

Table 4. Frequencies of intense reactions on the Sprint-E by time of assessment (Baton Rouge sample, N = 128)

	Referral		Pretreatment		Intermediate	
	n	percent	n	percent	n	percent
# Intense reactions						
0-2	6	4.7	13	10.2	60	46.9
3-6	20	15.6	40	31.3	34	26.6
7+	102	79.7	75	58.6*	34	26.6*
Specific intense reactions						
Intrusion	93	72.7	84	65.6	42	32.8*
Avoidance	80	62.5	69	53.9	38	29.7*
Numbing	95	74.2	83	64.8	40	31.3*
Arousal	110	85.9	94	73.4*	54	42.2*
Depression	109	85.2	102	79.7	48	37.5*
Impaired stress tolerance	100	78.1	96	75.0	59	46.1*
Impaired health behavior	81	63.3	81	63.3	34	26.6*
Bothered by reactions	112	87.5	85	66.4*	42	32.8*
Impaired role functioning	81	63.3	70	54.7	31	24.2*
Impaired social functioning	93	72.7	77	60.2*	43	33.6*
Need for assistance	102	79.7	96	75.0	54	42.2*
Declines in frequencies between time point and previous time point were tested with McNemar Test. *p < 0.05. †p < 0.001.						

social functioning. All intense reactions declined significantly in prevalence between pretreatment and intermediate treatment.

Table 5 shows the results of a repeated measures analysis of variance (ANOVA) of Sprint-E scores. The time effect was apportioned into two planned contrasts: referral vs pretreatment and pretreatment vs intermediate treatment. The overall effect of time of assessment was significant: for Sprint-E total, $F(2, 254) = 138.8, p < 0.001$; for number of intense reactions, $F(2, 254) = 146.1, p < 0.001$. Both contrasts between assessment points evidenced significant change. However, the decrease between referral and pretreatment was small ($ES = 0.31-0.34$), whereas the subsequent decrease between pretreatment and intermediate treatment was large ($ES = 1.16-1.19$).

Comment

Previous research has shown that the Sprint-E has high internal consistency and that the number of intense reactions on the tool is strongly related to acceptance of treatment referrals.²¹ The present study showed additionally (1) that the Sprint-E identifies adults in high distress, as evident in its correlations with other measures of posttraumatic stress and depression; (2) that the 3/7 rule provides reasonable guidance for making referrals to a mental health specialist; and (3) that Sprint-E scores are relatively stable in the absence of treatment but improve in its presence.

What does the 3/7 rule mean in practice? First, this rule essentially ignores reactions of moderate

intensity for the purpose of treatment referral. This might not be appropriate in all contexts, but it appears to be so in postdisaster settings, where some distress is normative and not necessarily indicative of disorder or treatment need. Notably, in the Florida sample, almost no one with PCL-defined PTSD failed to have at least three intense reactions on the Sprint-E. Second, the 3/7 rule acknowledges uncertainty. There is a tendency to instill cut-off points on psychological scales with definitive properties (such as diagnoses) when they are really only decision rules. In practice, the best decision rule is not necessarily the most efficient but is rather the one that offers the most appropriate combination of sensitivity and specificity for the setting and purpose. On the Sprint-E, the presence of 3 or more intense reactions is a highly sensitive decision rule. While this score will yield a sizable percentage of false positives, a score of this magnitude is indicative of *possible* treatment need and instructs the service provider (eg, crisis counselor, social worker, general practitioner) to have further conversation with the service recipient about his or her psychological needs and resources. This conversation might or might not result in a referral to treatment. When the provider is a paraprofessional, a score of 3 should call for additional evaluation by a mental health specialist who might or might not determine that a referral for psychological treatment is needed. In short, this level of symptoms should not be ignored but should not cause alarm. On the other hand, a score of 7 intense reactions almost assures the presence of PTSD or other patterns of clinically significant distress and

Table 5. Stability and change in Sprint-E means by time of assessment (Baton Rouge sample, N = 128)

Measure	Referral		Pretreatment			Intermediate		
	M	(SD)	M	(SD)	ES*	M	(SD)	ES*
Sprint-E total	44.8	(6.9)	42.3	(8.1)	0.31 [§]	32.9	(9.2)	1.16 [§]
# Intense reactions	8.3	(2.3)	7.3	(3.1)	0.34 [§]	3.8	(3.4)	1.19 [§]

* $ES = (M_{t-1} - M_t) / \text{pooled SD}$.
Mean at time point tested against mean at previous time point in planned contrasts, with $df = (1, 126)$.
[§] $p < 0.001$.

should be taken quite seriously. It is virtually impossible to achieve this score without acknowledging substantial dysfunction or interference, and thus it is indicative of *probable* treatment need.

We should note that the Sprint-E is not superior to the SPRINT as a brief measure of PTSD. If one is solely interested in assessing PTSD, there is no reason to use the Sprint-E which, although still brief, is 50 percent longer than the original (12 items vs 8 items). However, the additional items (plus one revised item) provide content that is useful in postdisaster assessment and referral, including depression, health behavior concerns, distress over reactions, perceived need for help, and potential suicidality. It is quite possible to achieve a score of 3 without having any intense symptoms of PTSD, which we view as a strength rather than shortcoming of the Sprint-E.

In addition, the measure appears to be sensitive to treatment-related change. The improvement of scores between pretreatment and intermediate treatment supports the validity of the Sprint-E as a measure of treatment need. The amount of change between referral and pretreatment evaluation in InCourage was greater than we anticipated but is not surprising, in retrospect. Referrals to this program come primarily from BRCIC, a telephone "life-line" that people may be most likely to call when their distress and perceived need for help is especially intense. Nevertheless, the average improvement between pretreatment and intermediate evaluation was far larger (3.5 intense reactions) than was the average change between referral and pretreatment evaluation (1 intense reaction).

Several limitations of our studies should be acknowledged. First, because of the nature of the programs that provided these data, it was not possible for us to evaluate the Sprint-E against clinician-administered measures. A comprehensive evaluation of psychological disorders would have allowed a more complete test of the capacity of the Sprint-E to detect a variety of mental health conditions. No evidence was presented here suggesting that the Sprint-E is sensitive to substance use disorders, and where this is a concern, the measure should be supplemented by additional screening measures. This limitation does not greatly harm the value of the study because PTSD

and depression are by far the most prevalent psychological problems after disasters and are often comorbid with each other and other conditions.¹ An additional issue is that, despite its popularity, the PCL is an imperfect measure of PTSD. It omits Criterion F (functional impairment), which is well measured on the Sprint-E.

A second limitation, related to the first, is that Study 1 most strongly supports a conclusion that the Sprint-E detects need for PTSD treatment rather than need for treatment per se. However, Study 2 supports a broader interpretation. We had reasoned that if the Sprint-E measures need for treatment, scores should decrease when that need is being met (treatment is received). Study 2 showed that Sprint-E scores decreased greatly after two sessions of CBT for Postdisaster Distress.³ The first two sessions of this treatment focus on anxiety reduction (eg, breathing retraining) and behavioral activation (eg, pleasant activity scheduling), methods that are used to treat a range of mood and anxiety disorders. Although there is clearly a need for further research on this point, we tentatively believe that the Sprint-E measures treatment needs that are not limited to PTSD.

Third, our research is limited to longer-term post-disaster distress. We do not know how well the Sprint-E distinguishes between serious and normative distress in the acute phase of a disaster, and we make no claim that it can predict long-term trajectories. For this reason, it is more appropriate to refer to the Sprint-E as an "assessment and referral tool" for *current* need than as a "screening tool," a term that sometimes carries a connotation of prognostication.⁶ We hope in future research to test the validity and utility of the measure in different phases of disaster recovery.

Finally, these studies were limited to persons seeking help, and the results may not necessarily apply to the general population. Again, we believe the 3/7 rule is helpful in this regard. The most efficient score in this sample (5 intense reactions) would not generalize to a population with a lower base-rate of PTSD, but a score of 7 was equally effective at detecting cases (76-79 percent) and noncases (78-84 percent). Moreover, even in the general population, it would be difficult to imagine someone with 7 out of 11

possible intense reactions who would not benefit from psychological or psychiatric interventions. We hope in future research to test the validity of the Sprint-E as a measure of population prevalence of treatment need.

In summary, notwithstanding these limitations, the Sprint-E appeared to perform well as a brief, easily administered measure of postdisaster distress and treatment need - outcomes of great concern to community-based service providers and planners in the aftermath of disasters. The evidence is ample to recommend use of the Sprint-E as an assessment and referral tool in situations where more in-depth assessment is not feasible and mental health programs and services are not available.

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References

- Norris F, Friedman M, Watson P, Byrne C, Diaz E, Kaniasty K: 60,000 Disaster victims speak: Part I, an empirical review of the empirical literature, 1981-2001. *Psychiatry*. 2002; 65: 207-239.
- Davidson J: Surviving disaster: What comes after the trauma? *Brit J Psychiatry*. 2002; 181: 366-368.
- Hamblen J, Gibson L, Mueser K, Norris F: Cognitive behavioral therapy for prolonged disaster distress. *J Clin Psychol: In Session*. 2006; 62: 1043-1052.
- Litz B, Gibson L: Conducting research on mental health interventions. In Ritchie EC, Watson P, Friedman M (eds.): *Interventions Following Mass Violence and Disasters: Strategies for Mental Health Practice*. New York: Guilford; 2006: 387-404.
- National Institute of Mental Health: *Mental health and mass violence: evidence based early psychological intervention for victims/survivors of mass violence*. NIH Publication Office No. 02-5138. Washington, DC: U.S. Government Printing Office, 2002.
- Wessely S: What mental health professionals should and should not do. In: Neria Y, Gross R, Marshall R, Suzzer E (eds.): *9/11: Mental Health in the Wake of Terrorist Attacks*. New York: Cambridge University Press, 2006: 543-569.
- Flynn B: Mental health services in large scale disasters: An overview of the Crisis Counseling Program. *NCPTSD Clin Q*. 1994; 4: 1-4.
- Weisler R, Barbee J, Townsend M: Mental health and recovery in the Gulf Coast after Hurricanes Katrina and Rita. *JAMA*. 2006; 296: 585-588.
- Covell N, Essock S, Felton C, Donahue S: Characteristics of Project Liberty clients that predicted referrals to intensive mental health services. *Psychiatric Serv*. 2006; 57: 1313-1315.
- Stithman A, Pescosolido B, Cabassa L: Building a model to understand youth service access: The Gateway Provider Model. *Ment Health Serv Res*. 2004; 6: 189-198.
- Connor K, Davidson J: SPRINT: A brief global assessment of post-traumatic stress disorder. *Int Clin Psychopharmacol*. 2001; 16: 279-284.
- Galea S, Nandi A, Vlahov D: The epidemiology of post-traumatic stress disorder after disasters. *Epidem Revs*. 2005; 27: 78-91.
- Davidson J, Weisler R, Butterfield M, et al.: Mirtazapine vs. placebo in posttraumatic stress disorder: a pilot trial. *Biol Psychiatry*. 2003; 53: 188-191.
- Kim W, Pae C, Chae J, Jun T, Bahk W: The effectiveness of mirtazapine in the treatment of post-traumatic stress disorder: A 24-week continuation therapy. *Psychiatry Clin Neurosci*. 2005; 59: 743-747.
- Silove D, Bryant R: Rapid assessments of mental health needs after disasters. *JAMA*. 2006; 296: 576-578.
- Bebbington P, Marsden L, Brewin C: The need for psychiatric treatment in the general population: The Camberwell needs for care survey. *Psychol Med*. 1997; 27: 821-834.
- Ezpeleta L, Granero R, de la Osa N, Doménech M, Guillamón N: Perception of need for help and use of mental health services in children and adolescents. Do they share the same predictors? *Psychol Spain*. 2003; 7: 19-28.
- Pincus H, Zarin D, First M: Clinical significance and DSM-IV. *Arch Gen Psychiatry*. 1998; 55: 1145-1146.
- Meadows G, Burgess P, Fossey E, Harvey C: Perceived need for mental health care: Findings from the Australian national survey of mental health and well-being. *Psychol Med*. 2002; 30: 645-656.
- Nelson C, Park J: The nature and correlates of unmet health care needs in Ontario, Canada. *Soc Sci Med*. 2005; 62: 2291-2300.
- Norris F, Donahue S, Felton C, Watson P, Hamblen J, Marshall R: A psychometric analysis of Project Liberty's adult enhanced services referral tool. *Psychiatric Serv*. 2006; 57: 1328-1334.
- Southam-Gerow M, Ringeisen H, Sherrill J: Integrating interventions and services research: Progress and prospects. *Clin Psychol: Sci Practice*. 2006; 13: 1-8.
- Centers for Disease Control: Assessment of health-related needs after Hurricanes Katrina and Rita - Orleans and Jefferson Parishes, New Orleans Area, Louisiana, October 17-22, 2005. *MMWR*. 2006; 55: 38-41.
- Weatherers F, Litz B, Herman D, Huska J, Keane T: The PTSD checklist (PCL): Reliability, validity, and diagnostic utility. Paper presented at the Annual Meeting of the International Society for Traumatic Stress Studies, San Antonio, Texas, October, 1993.
- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders* (4th edn.). Washington, DC: American Psychiatric Association, 1994.
- Blanchard E, Jones-Alexander J, Buckley T, Forneris C: Psychometric properties of the PTSD checklist. *Behav Res Therapy*. 1996; 34: 669-673.
- Kahout F, Berkman L, Evan D, Cornoni-Huntley J: Two shorter forms of the CES-D depression symptoms index. *J Aging Health*. 1993; 5: 179-193.
- Matthey S, Petrovski P: The children's depression inventory: Error in cutoff scores for screening purposes. *Psychol Assess*. 2002; 14: 146-149.

Appendix

Short Posttraumatic Stress Disorder Rating Interview–Expanded (Sprint-E)

Interviewer-administered version

These questions are about the reactions you have experienced *in the past month*. By *reactions*, I mean feelings, emotions, or thoughts about what happened during the event or since.

Read response options for each question unless it is clear you don't need to:

(1) Not at all, (2) A little bit, (3) Moderately, (4) Quite a bit, (5) Very Much

Circle the number that corresponds to the respondent's answer.

Question to be read	Respondent's answer	
S1. How much have you been bothered by unwanted memories, nightmares, or reminders of what happened?	1 2 3	4 5
S2. How much effort have you made to avoid thinking or talking about what happened or doing things that remind you of what happened?	1 2 3	4 5
S3. To what extent have you lost enjoyment in things, kept your distance from people, or found it difficult to experience feelings because of what happened?	1 2 3	4 5
S4. How much have you been bothered by poor sleep, poor concentration, jumpiness, irritability or feeling watchful around you because of what happened?	1 2 3	4 5
S5. How down or depressed have you been because of what happened?	1 2 3	4 5
S6. Has your ability to handle other stressful events or situations been harmed?	1 2 3	4 5
S7. Have your reactions interfered with how well you take care of your physical health? For example, are you eating poorly, not getting enough rest, smoking more, or finding that you have increased your use of alcohol or other substances?	1 2 3	4 5
S8. How distressed or bothered are you about your reactions?	1 2 3	4 5
S9. How much have your reactions interfered with your ability to work or carry out your daily activities, such as housework or schoolwork?	1 2 3	4 5
S10. How much have your reactions affected your relationships with your family or friends or interfered with your social, recreational, or community activities?	1 2 3	4 5
S11. How concerned have you been about your ability to overcome problems you may face without further assistance?	1 2 3	4 5
Number of answers circled in last column (this is respondent's score). Write number in the box to the right.		
S12. I also need to ask: Is there any possibility that you might hurt or kill yourself?	<div style="display: flex; justify-content: space-around;"> 0 NO 1 YES </div>	
If yes, refer for immediate psychiatric intervention.		
If no, continue on back of this form for instructions.		
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